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ABSTRACT

This paper explores the effects of the childbirth environment and demographic variables on the laboring woman's expressions of tension and pain. Four observable physical measures were combined into a behavioral index of pain and tension: irregular breathing, tension of the upper extremities (rigid muscle flexion), vocalizations of pain (a cry, scream, or moan), and agitated body movement. A mean pain-tension index was computed for the time units in which each woman had a uterine contraction and for periods of rest between contractions. These measures were correlated with the woman's age, race, childbirth training, and a list of observable labor room events (medical procedures and social interactions). Subjects were recruited upon entering a large hospital to deliver. Thirteen hours of data were collected. Results showed that age is inversely correlated with the pain index, older women expressing less pain than younger women, and white women expressing less pain than black women. Parental education and income levels were related to attitudes, expectations and anxieties of prospective parents during pregnancy. Training for childbirth through preparation classes was not significantly related to observable pain during labor, although it was found that women who were trained rarely showed great pain. Factors which might indicate physical difficulty of labor were considered in relation to the pain-tension index. Labor room events which significantly correlated with the pain-tension index were various verbal and behavioral interactions between father and mother. (SB)

Observational Data on the Psychological Experience of Childbirth

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The setting to which our research has taken us is the obstetric unit of a modern hospital which utilizes scientific technology to minimize childbirth tragedies yet is responsive to the new wave of sentiment that childbirth is a couple experience and that some expectant parents want to make active input into their birth event. We were interested in how parents in this setting experience labor, in particular, how the environment interacts with the laboring woman's expressions of tension and pain.

At the onset, however, I want to mention an anomaly of conducting research on childbirth that has meant that I have data on 13 labors to present to you. Contrary to the routine of a 9-to-5 workday, onset of labor is usually not predictable. There are two options available for recruitment of participants: the researcher can recruit during pregnancy and be prepared to rush to the hospital at any time--day or night, weekday or weekend--to observe when the woman goes into labor or the researcher can schedule one or two days a week at the hospital to recruit after admission and hope that an appropriate research candidate is available. We chose the latter course at a hospital that has 3,000 births annually and our sample criteria were not strict: primiparous women had to be in uncomplicated, non-anesthetized labor with the father in the labor room at least some of the time--a practice which the hospital encourages. Yet even these requirements proved to be restrictive, for since June 1975--when instrument development was complete and we began data collection--we have set aside 58 days for observation and have successfully obtained 13 hours of data. The cost-efficiency of such a project is th[illegible]re suspect but I hope that the data will be of interest, for they do capture the rich variety of events in the childbirth environment

and speak to the impact of these events on the physical state of the laboring woman.

There are many ways to look at these comprehensive data, but for this presentation, we are focusing on the relationship between the woman's pain and contextual variables. We have taken four categories from the observation instrument which refer to the physical state of the woman and combined them into a behavioral index of pain and tension. These are: (1) from the breathing category, the code 'irregular' breathing which has a gasping quality; (2) from the category of tension of upper extremities and face, codes of 'tense' or 'very tense,' indicating rigid flexion of muscles; (3) from the vocalization category, the codes 'cry,' 'scream,' or 'moan'; and (4) from the category of body movement, the code 'movement' which indicates that the woman was in agitated motion. Occurrences of these four indicators of pain or tension were summed in each time unit of observation so that for each time unit a woman could have a score of '0,' meaning that she exhibited none of the specified signs of pain or tension, to a score of '4' when she showed all of the specified pain or tension behaviors. These scores, of course, refer to observable behaviors and do not necessarily indicate the level of perceived pain.

Consistent with our interest in behaviors in context--including the physiological context--we computed a mean pain-tension index for each woman for the time units in which she had a uterine contraction and a mean pain-tension index for periods of rest between contractions. The significance of pain and tension which has no acute physiological basis may be quite different from expressions of pain during forceful contractions.

We are looking, then, for correlates of expressions of pain and tension during labor in three categories of variables on which we have data. First, there are demographic or historical characteristics of the

the mothers--age, race, and childbirth training. Perhaps women come to labor with different expectations about the pain of childbirth or with patterns of coping with discomfort characteristic of their subculture group. The second category of variables includes indices of the course of labor from the hospital record. Although we only observed labors which were considered normal or medically uneventful, perhaps there are subtle differences in the difficulty of labor which are reflected in pain and tension. Finally, are the events and social interactions which impinge on the laboring woman related to her physical state?

Of the demographic variables on which we have data, we find that mother's age and race are significantly associated with the behavioral index of pain and tension during periods of contractions. Age is inversely correlated with the pain index ($r=-.54$; $p<.05$) in that older women express less pain than do younger women. White women also show less pain than do black women ($X^2=6.20$; $p<.05$). These findings are reminiscent of a 1965 study by Werts, Gardiner, Mitchell, Thompson and Oliver who report on an interrelated network of social variables associated with judgments of psychological labor difficulty: age, social class, race, marital status, and private versus clinical medical care. On the basis of sophisticated statistical procedures inappropriate in our study, those authors conclude that there is a "real" relationship between mother's education and difficulty of labor and the other variables which are associated with education thus bear spurious correlations with labor difficulty. These same kinds of factors were also highlighted in a recent study of sources of infant temperament conducted in our lab at NIH. We found that parental characteristics of demography (age, educational and income levels) were related to the attitudes, expectations, and anxieties of prospective parents during pregnancy, the use of pain-relieving medications

during childbirth, and to behaviors of the newborn infant (Standley, Soule, Copans and Klein, manuscript in preparation) Future attempts to specify historical and environmental sources of childbirth pain will surely need to examine a variety of demographic and parental factors in detail.

It is interesting that the other historical variable on which we had data--training for childbirth through preparation classes--was not significantly related to observable pain during labor. However, in this small sample, we find that childbirth training is not requisite for minimal pain or tension but that women who are trained rarely show great pain. We agree with Doering and Entwisle (1975) that categorization as "trained" or "untrained" is not sufficient in that there are varying degrees of preparation. A more refined variable may have enabled us to distinguish between those "untrained" women in the high and low pain behavior groups.

A number of factors which might indicate some physical difficulty of labor were considered in relation to the pain-tension index. These included: (1) various indicators of the course of labor such as analgesic medication and duration of labor and (2) characteristics of the infant at birth--birthweight, one-minute Apgar score, and sex. None of these variables was found to be significantly associated with the pain-tension indices from the labor observation so we must conclude that the observed differences in pain behaviors do not reflect physiological labor difficulty to any great extent.

We turn now to the events of the labor room to see if the laboring woman's environment--the medical procedures and social interactions with people around her--are related to the woman's physical state. This is the focus of our observation method.

Table 2 first illustrates the wide range of occurrences of coded behaviors of fathers and nurses with the mother. (We have not analyzed the

data on physician behaviors or ratings because of their infrequent presence in these cases.) The ranges indicated provide a dramatic description of the extremely different labor room settings. Note, for example, that in the category of supportive events at least one woman was never touched by the father in the hour of observation while another was touched in all time units. Although the zeros are redundant we feel they are a useful reminder that for at least one woman each event did not occur. The range of total events occurring in the observation hour also reflects the variety of stimulus conditions among different settings: in one very restrictive (or deprived) setting there was a total of only 14 events, i.e., only 14 things happened to the woman in an hour, while in another very stimulating environment 144 events occurred in the hour.

The significant correlations between observed events and pain-tension indices from contraction and resting time units are also in Table 2. Beginning with the statistics on the nursing behaviors listed in the right columns, we find that these events are not commonly related to observed pain except that women who show pain are more likely to discuss the pain with the nurses and to draw the nurses' attention away from the fetal monitor.

The interactions between the father and mother, however, are clearly related to the woman's expressions of pain and tension. Their conversational interaction is an especially salient feature of the environment to the woman's discomfort: when the mother and father often talk about the course of labor, the woman's well-being and topics unrelated to the childbirth, the woman is unlikely to be in pain. The one non-conversational event which relates to minimal pain is the offering of comfort items; other supportive behaviors--touching and modeling breathing--are not effective in alleviating tension. A distinction is therefore drawn between a behavior which is appreciated by the laboring woman--its intent and usefulness may be support--and a behavior

which is of consequence to the woman's pain and tension. In other words, concern and attentiveness may not be "enough" to help the woman's pain. We recall one woman who was obviously tense throughout the hour of observation and the concerned father who stayed close to the bed and quietly held her hands. Judging from the woman's response, she valued the support but according to the codes, it was ineffective for pain reduction. In contrast, there are specific behaviors--offering of comfort items and conversation--which do seem to be effective analgesics.

The rating scales also refer to the character of the interaction alone or to its consequence for pain-relief and it is not surprising that those ratings which refer to the effectiveness of the mother-father interaction and the nursing care are actually correlated with the index of pain and tension during contractions. The contraction is the primary stress event and the behaviors which impact on that stress are of considerable importance. In contrast, correlations between the two ratings of the character (physical intimacy and quality) of the mother-father relationship did not correlate significantly with the pain-tension indices.

I have been speaking of these relationships in terms of a one-way causal model: behaviors of the father impact on the woman's expressions of pain, i.e., to alleviate her pain. The other direction of effect is also likely: the woman who is not distressed is more available for interaction. More accurately, in the reality of the labor room, the events and woman's physical state co-occur, and there is a circularity of influence: the woman is not very tense; the father encourages her with conversation about the labor and how "well" she is doing; the mother is not tense; and so on.

The observation method thus provides descriptions of couple systems of interaction in the childbirth process which can take a variety of forms

and result in a range of consequences. A man and woman may encounter the birth of their child in a pathetic estrangement--distanced as if they do not know each other; they may find solace in the presence of the other yet the woman must privately experience her pain; or they may together exercise power over the childbirth process--especially its pain and tension--and thereby fashion a mutual giving birth.

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Table 11

BEHAVIORAL EVENTS	FATHER Range Min.	FATHER Range Max.	FATHER Significant Correlations with Pain-Tension Index Contraction Units	FATHER Significant Correlations with Pain-Tension Index Rest Units	NURSE Range Min.	NURSE Range Max.	NURSE Significant Correlations with Pain-Tension Index Contraction Units	NURSE Significant Correlations with Pain-Tension Index Rest Units
Supportive								
Touch	0	60			0	5		
Comfort Item	0	7	-.66*		0	2		
Breathing	0	17			0	1		
Medical								
Maintenance	0	2			0	10		
Exam	--	--			0	1		
Medication	--	--			0	6		
Fetal Monitor	0	2			0	7	-.82‡	
CONVERSATION								
Supportive								
Well-Being	0	35	-.81‡		0	12		
Breathing	0	14			0	3		
Baby	0	5			0	1		
Relationship	0	4			0	1		
Non-Delivery	0	9	-.55*	-.78**	0	3		
Medical								
Labor	0	19	-.56*	-.56*	0	9		
Pain	0	6			0	3	.57*	.55*
Medication	0	3			0	2		
Procedures	0	4			0	4		

RATING SCALES	Significant Correlations with Pain-Tension Index Contraction Units	Rest Units
Physical intimacy of mother-father relationship		
Quality of mother-father relationship		
Effectiveness of mother-father system in comforting the mother	-.68**	
Effectiveness of nursing care	-.66*	

Note: ‡p<.001
**p< 01
*p<.05